

September 7, 2012

Marlene H. Dortch, Secretary
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20554

Re: ET Docket No. 08-59, Amendment of the Commission's Rules to Provide
Spectrum for the Operation of Medical Body Area Networks ("MBANS")

Dear Ms. Dortch,

On September 5, 2012, representatives of Philips Healthcare ("Philips"), GE Healthcare ("GE"), and the Aerospace and Flight Test Radio Coordinating Council ("AFTRCC") participated in a teleconference call with staff from the Commission's Office of Engineering and Technology. Attending the call on behalf of Philips were Delroy Smith, Dong Wang, and David Siddall (counsel); for GE was Neal Seidl; for AFTRCC were Ken Keane and Dan Jablonski; and for the FCC were Rashmi Doshi, Geraldine Matise, Mark Settle, Brian Butler, Bill Hurst and Mark Newman.

The purpose of the teleconference was to discuss future Commission equipment authorization testing requirements for MBAN devices pursuant to the rules adopted in the First Report and Order in this proceeding, 27 FCC Rcd 6422 (2012). Diagrams and an outline of rules provisions from Part 95 that apply to MBANS devices and that appear to require technical testing for equipment authorization purposes were emailed to the FCC participants to assist in the discussion and are attached to this letter.

In addition to a short discussion of selected rules sections, a general discussion of the equipment authorization process for new types of equipment clarified what should be expected when equipment is ready for testing.

Marlene H. Dortch, Secretary
September 7, 2012
Page 2

Pursuant to Section 1.1206 of the Commission's Rules, this letter is being electronically filed in Docket ET 08-59 and emailed to FCC staff participants. Questions may be referred to David Siddall at the address below.

Respectfully Submitted,

_____/ s /_____
David R. Siddall, Esq.
Counsel to Philips Healthcare
DS Law, PLLC
1629 K St. NW, Ste. 300
Washington, DC 20006
(202) 559-4690

_____/ s /_____
Ari Q. Fitzgerald, Esq.
Counsel to GE Healthcare
Hogan Lovells US LLP
555 Thirteenth St. NW
Washington, DC 20004
(202) 637-5600

_____/ s /_____
William K. Keane, Esq.
Counsel to AFTRCC
Duane Morris LLP
505 Ninth St. NW, 9th Flr
Washington, DC 20004
(202) 776-7800

Attachments

Teleconference – Sept. 5, 2012

Purpose: Discuss interpretation of the FCC's service rules and expected attestation and certification requirements for MBAN equipment.

Attest to Spectrum Control and Indoor Limitation.

MBAN manufacturers must attest to the details of controlling MBAN device access to 2360-2390 MHz.

- Describe the information conveyed in the control message (e.g. channel list, subbands, max TX power, etc).
- Describe the mechanism to distribute the control message to all MBAN devices within a healthcare facility (indoors only) and the device's maximum reception periodicity (i.e. the maximum time between reception of last valid control message and next valid control message for which the device will continue use of the 2360-2390 MHz band according to the last valid control message and not revert to default non- 2360-2390 MHz operation).
- Describe any additional mechanism(s) that limit use in 2360-2390 MHz to indoors only.

Test for 95.628(c)

Test to verify that P/C transmitter does not transmit within 2360-2390 MHz until valid control message is received.

- Disable control message to DUT
- Apply power to DUT
- Verify MBAN DUT does not commence transmission in 2360-2390 MHz.

Test to verify that P/C transmitter operates in 2360-2390 MHz only in accordance with valid control message

- Establish LAN connection between DUT and control point
- Enable control message to the DUT
- Set desired frequency or sub band within 2360-2390 MHz per manufacture definition (e.g. specific IEEE 802.15.4j or IEEE 802.15.6 channels). Verify that DUT limits 2360-2390 MHz transmissions to the elected desired frequency or sub band as directed by control message.
- Set the control message to prohibit operation in 2360-2390 MHz. Verify that DUT ceases all transmissions in 2360-2390 MHz with latency not exceeding the maximum

reception periodicity and also, if specified, the maximum control message update latency¹.

- Set the control message to enable MBAN operation in 2360-2390 MHz. Verify that DUT resumes transmissions in 2360-2390 MHz.
- Disable or interrupt control message reception. Verify that DUT ceases all transmissions in 2360-2390 MHz within the maximum reception periodicity.

Test to verify that Body-Worn transmitter ceases transmissions in 2360-2390 MHz when it loses connection with the P/C transmitter.

- Establish connections between DUT and the P/C transmitter and between P/C transmitter and control point. See example(C) block diagram below.
- Configure the control message at control point to enable operation in 2360-2390 MHz. Verify transmissions in 2360-2390 MHz are consistent with the configuration.
- Attenuate or interrupt the MBAN RF signal from the P/C transmitter until DUT and the P/C Transmitter communication is lost. Any large enough attenuation (e.g. 130 dB) that can break the link is sufficient. Verify that DUT ceases all transmissions in 2360-2390 MHz. A spectrum analyzer can be used to monitor transmissions.

Test for 95.628(d) [applies to both P/C and body-worn transmitters]

- Verify frequency stability +/- 100 ppm over temperature range from 0°C to 55°C

Test For 95.633(e)(1) Emission Bandwidth [applies to both P/C and body-worn transmitters]

- Verify 5 MHz maximum emission bandwidth at -20 dB points with instrument settings used for measurement in accordance with 95.633².

Test for 95.635(d)(1)(v)(7) unwanted emissions [applies to both P/C and body-worn transmitters]

¹ In typical expected implementations (e.g. where control messages are periodically broadcast by the control point with a period that is a fraction of the devices' maximum reception periodicity and/or sent immediately upon any user-initiated configuration change), modification to authorized 2360-2390 MHz operation would be expected to occur with significantly less delay than the maximum reception periodicity. If the manufacturer includes such details in the attestation, then they could be verified in testing, however the FCC's rules only require the maximum reception periodicity be disclosed and verified in certification.

² **95.633:** Emission bandwidth will be determined by measuring the width of the signal between points, one below the carrier center frequency and one above the carrier center frequency, that are 20 dB down relative to the maximum level of the modulated carrier. Compliance with the emission bandwidth limit is based on the use of measurement instrumentation employing a peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

- Verify that unwanted emission in the first 2.5 MHz outside 2360-2400 MHz band attenuated by at least 20dB relative to max EIRP³ in a 1 MHz bandwidth.
- Verify low band edge power in 1 MHz bandwidth within 2357.5-2360 MHz is attenuated minimum of 20dB relative to max in-band EIRP by setting DUT to operate at the channel or sub band closest to the 2360 MHz edge according to supported normal operating configurations.
- Verify high band edge power in 1 MHz bandwidth within 2400-2402.5 MHz is attenuated minimum of 20dB relative to max in-band EIRP by setting DUT to operate at the channel or sub band closest to the 2400 MHz edge according to supported normal operating configurations.
- Verify DUT unwanted emission up to 10x operating frequency and for sub-harmonics of operating frequency.

Tests for 95.639 maximum transmitter power [applies to both P/C and body-worn transmitters]

- 95.639(f)(3): In 2360-2390 MHz maximum EIRP is the lesser of 1mW or $10 \cdot \log(B)$ dBm, where B is the 20dB emission BW in MHz. Configure (if applicable) DUT for maximum transmit power in 2360-2390 MHz. Verify EIRP at minimum, mid point, and maximum selectable frequencies in 2360-2390 MHz.
- 95.639(f)(4): In 2390-2400 MHz, maximum EIRP shall not exceed the lesser of 20mW or $16 + 10 \cdot \log(B)$ dBm, where B is the 20dB emission BW in MHz. Configure (if applicable) DUT for maximum transmit power in 2390-2400 MHz. Verify EIRP at minimum, mid-point and maximum selectable frequencies in 2390-2400 MHz.
- 95.639(f)(5): antenna must be integrated, EIRP measured per 95.627(g) or 95.628 (h). Verify antenna construction and EIRP.

Tests for 95.1217 labeling

- 1217(a)(3): statement on P/C transmitters related to secondary use or, if not feasible to add statement to device, in instruction manual. Verify that required information is on P/C Transmitter device or in instruction manual.
- 95.1217(c): In 2360-2400 MHz, P/C transmitter must be identified with serial number. Verify FCC ID on all device or, if FCC ID cannot fit on device, in instruction manual.

³ Use of peak detector for EIRP test: 95.628.f: “Compliance with the maximum transmitter power requirements set forth in §95.639(f) shall be based on measurements using a **peak detector** function and measured over an interval of time when transmission is continuous and at its maximum power level. In lieu of using a peak detector function, measurement procedures that have been found to be acceptable to the Commission in accordance with §2.947 of this chapter may be used to demonstrate compliance”. The FCC also provides detailed procedures for measuring burst pulsed transmitters that may apply based on MBAN modulation scheme.

- Verify FCC ID labeling defined for P/C transmitter device.
- Verify FCC ID labeling defined for body-worn device.

RF Exposure Test for 95.1221: MBAN transmitters (as defined in appendix 1 to subpart E of part 95) are subject to the radiofrequency radiation exposure requirements specified in §§1.1307 and 2.1093

- Verify the RF exposure for DUT in 2360-2390 MHz and 2390-2400 MHz.
- The device transmitter duty cycle is included in this verification, measure & record DUT transmitter duty cycle.

“The modulation shall be adjusted to produce the maximum duty cycle possible during measurements” Or refer to ANSI C63.4

Certification test-Considerations

- Test samples of product shall be provided as intended for end user installation and usage.
- Test sample with test connectors is recommended where possible to facilitate testing.
- Test protocol allows P/C transmitter device RF parameters to be characterized while supported by a Body-Worn Transmitter and a control network.
- Test protocol allows Body-Worn Transmitter RF parameters to be characterized, while supported by a MBAN P/C Transmitter device and a control network.
- Provide means for certification tester to define the allowed MBAN frequencies or sub band to be used within the control message.
- An MBAN device may have an integrated power source that is not removable. The manufacturer shall provide information to activate and deactivate the device.
- The network or other technology for control point to hub connectivity shall be described to facilitate testing of P/C Transmitter and Body-Worn Transmitter devices. This may include WMTS, 802.11 WLAN, and/or other wired or wireless LAN. For a configuration example see example block diagram below.
- MBAN device type shall be declared as a Body-Worn Transmitter device or a P/C Transmitter device, or both (e.g. a device that could be configured in either mode).